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AGRICULTURAL PRACTICES SHAPE MICROBIAL COMMUNITIES AND CHANGE FRESH AND SOIL ORGANIC MATTER MINERALIZATION IN A TROPICAL SOIL.

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Priming effect (PE) is defined as a stimulation of the mineralization of soil organic matter (SOM) due to fresh organic matter (FOM) supply. This process leads simultaneously to a loss of carbon to the atmosphere and to a remobilization of nutrients. PE should thus be considered in the management of residues or amendments in agricultural soils, especially where soil fertility is essentially based on organic supply. In Madagascar, the Direct-seeding Mulch based cropping (DMC) systems appeared to be an opportunity for the development of a sustainable upland rice culture. In DMC systems soil is not tilled and protected from physical erosion by dead or alive cover plants and/or mulches of crop residues. DMC systems are also known to increase soil organic matter stocks in the first centimetres below the mulch layer. As the quality of FOM is a determinant of the priming effect process, we were interested to evaluate whether the quality of mulches could shape the belowground microbial community and impact its capacity to mineralize SOM. In 2010, we sampled soil samples from a field experimentation set up in 2003 in the centre of Madagascar. The 10 first centimetres under three crop mulches (two grasses and one legume) and two different fertilizations (organic and organic + mineral), were sampled during the rice growing season. Soils were incubated in the presence of 13C-enriched wheat straw residue to measure their FOM and SOM mineralization capacity. Bacteria involved in both fluxes were identified by the coupling between DNA-SIP and pyrosequencing techniques.